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influence and importance of nitrogen in vegetable physiology, by noticing, in the first place, the experiments of Dr. Daubeny, M. De Saussure, Sir Humphry Davy, and those which he himself has made ; all of which tend to prove that nitrogen is evolved during the healthy performance of the functions of plants ; that the proportion which it bears to the oxygen given off is influenced by the sun's rays ; but that owing to the necessary exclusion of the external atmosphere during the progress of the experiments, it is impossible, with any degree of accuracy, to calculate the volume of these evolved gases during any period of the growth of plants in their natural state.

If to this indefinite quantity of nitrogen given off by plants there be added that definite volume incorporated into their substance and shown in the author's former tables, the question arises, whence do plants derive their nitrogen, and does any part of it proceed from the atmosphere ? A problem which the author proposes to solve by a series of tabulated experiments upon seeds, and seedling plants, indicating a large excess of nitrogen in the latter, and under such circumstances of growth that he is compelled to fix upon the atmosphere as its source.

By the same mode of experimenting, the author attempts to show that the differences which we find in the germination of seeds and the growth of plants in the shade and sunshine, are apparently due in a great measure to the influence of nitrogen. And he concludes by observing, that he does not touch upon the practical application of the subject wherein the real value of the inquiry consists ; it is his object to draw attention to an element which, though in some instances so minute in quantity as to be with difficulty detected in our balances, has nevertheless been wisely assigned to discharge the most important functions.

“ On the decussation of fibres at the junction of the Medulla Spinalis with the Medulla Oblongata.” By John Hilton, Esq. Communicated by P. M. Roget, M.D., Sec. R.S.

The author first alludes to what usually happens in affections of the brain, namely, that the loss of voluntary power and of sensation manifest themselves in the opposite side of the body to that in which the cerebral lesion exists, a fact which has been attempted to be explained by the crossing of the fibres at the junction of the *medulla oblongata* with the anterior or motor columns of the *medulla spinalis* ; but such a structure, he observes, affords no explanation of the loss of sensation. The author then, referring to the communication of Sir Charles Bell to the Royal Society, in the year 1835, describing a decussation connected with the posterior columns, or columns of sensation, mentions that the accuracy of these dissections was doubted by Mr. Mayo and other eminent anatomists. The author proceeds to state that the symptoms of cerebral lesion do not always take place on the opposite side of the body to that in which the lesion of the brain exists, but that they occur sometimes on the same side ; that the loss of power and of sensation, although confined to the same side, may exist in either the upper or the lower extremity ;

but that both are not necessarily implicated ; and that, in fact, cases occur where there are marked deviations from what may be considered the more common occurrence. Having observed such cases, and not being aware of any satisfactory explanation, the author examined with care the continuation upwards of the anterior and posterior columns of the spinal marrow into the *medulla oblongata* and found that the decussation at the upper part of the spinal marrow belonged in part to the columns for motion, and in part to the columns for sensation ; and farther, that the decussation is only partial with respect to either of these columns ; thus elucidating by the observation of the actual structure what before appeared very unsatisfactory in pathology, and anomalous in disease.

The paper is illustrated by drawings made from the dissections of the author.

“Description of a self-registering Thermometer and Barometer invented by the late James Coggan, Esq., and bequeathed by him to the Royal Society.” By Roderick Impey Murchison, Esq., F.R.S., V.P.G.S., &c.

The self-registering thermometer used by Mr. Coggan is of Six’s construction, and consists of a siphon tube, open at one extremity, and operating by the expansion and contraction of a large body of spirit pressing on a column of mercury in the lower bend of the tube. On the other side of the wooden frame to which this thermometer is fixed, a siphon barometer is attached ; and both these instruments are made to act on iron-floats suspended by a thread, and counterpoised over a pulley. Transverse wires are affixed to these threads, and are forced against a sheet of ruled paper on a frame, which from its connexion with a clock is advanced a certain space each day, by a spring hammer forming part of the striking machinery of the clock.

“On the action of light upon the colour of the River Sponge.” By John Hogg, M.A., F.L.S., C.P.S., &c., Fellow of St. Peter’s College, Cambridge. Communicated by Thomas Bell, Esq., F.R.S.

The author found that the green colour of the *Spongilla fluviatilis*, or river sponge, is acquired solely through the agency of light, and is lost when the sponge is removed from its influence. As this does not appear to be the case with *Actiniae*, the *Hydra viridis*, or any other Polype, the author is disposed to consider this production as being nearer allied to the Algæ or Fungi, than to any tribe belonging to the animal kingdom.

“Researches on the Tides. Ninth Series. On the deduction of the Laws of the Tides, from short Series of Observations.” By the Rev. W. Whewell, M.A. Trin. Coll., Cambridge.

It is very desirable to ascertain whether it is possible to deduce the laws of the tides from short series of observations ; since, if it be so, not only does the construction of good tide tables for different places become more easy ; but also the value of tide tables is much increased, if the predicted tides agree with those of each year as well as with the mean of many years. The object of the author